

1,045,711.

Fig. 1.

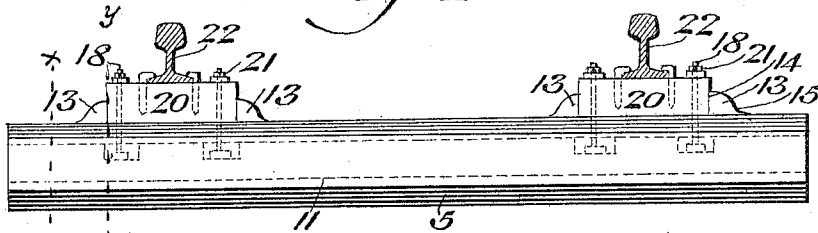


Fig. 2.

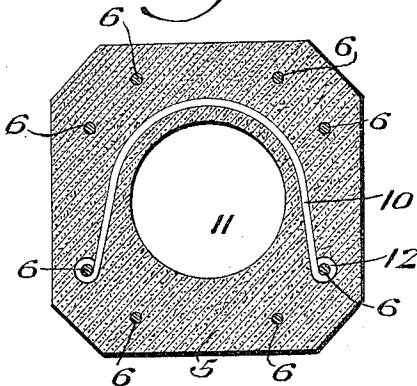


Fig. 3.

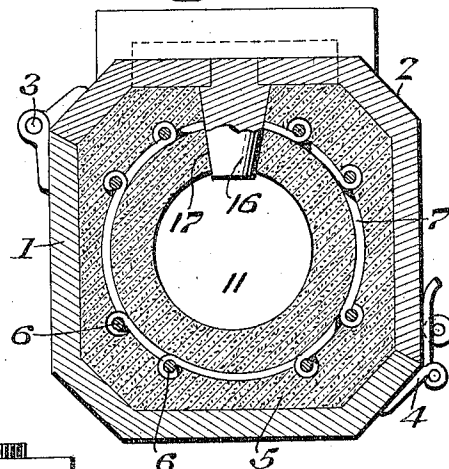
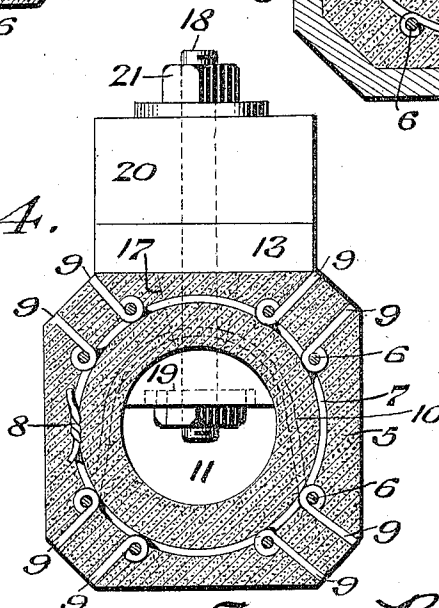


Fig. 4.



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UNITED STATES PATENT OFFICE.

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HOLLOW REINFORCED-CONCRETE TIE.

1,045,711.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Original application filed September 27, 1911, Serial No. 651,561. Divided and this application filed December 1, 1911. Serial No. 663,305.

To all whom it may concern:

Be it known that I, HENRY R. LEONARD, a citizen of the United States, residing at Wayne, in the county of Delaware, State of Pennsylvania, have invented a new and useful Hollow Reinforced-Concrete Tie, of which the following is a specification.

My present invention relates to a novel construction of a hollow reinforced concrete tie for railroad purposes.

In a copending application filed by me on the 27th day of September, 1911, Serial No. 651,561, and of which the present application is a division, I have described and broadly claimed a novel method of making a hollow reinforced concrete tie, such as is herein shown, which is produced by placing the concrete mixture and the reinforcements within a mold then causing the mold to rotate to subject the concrete mixture to a centrifugal action, which causes the outer portion of the concrete tie to be of relatively greater density than the inner portion thereof, and by such method I am enabled to entirely dispense with a core, and the apertures in the tie for the fastening devices, as well as the rail chair spacing lugs are formed in the tie during process of manufacture.

With the above in view, my invention consists of a novel construction of a hollow reinforced concrete tie.

It further consists of a novel construction of a hollow reinforced concrete tie having reinforcements near each end to prevent injury to the tie by the lifting jacks, when such are employed to raise the tie from its bed.

It further consists of a novel construction and arrangement of reinforcements.

It further consists of other novel features of construction all as will be hereinafter fully set forth.

For the purpose of illustrating my invention, I have shown in the accompanying drawings, one form thereof which is at present preferred by me, since the same has been found in practice to give satisfactory and reliable results, although it is to be understood that the various instrumentalities of which my invention consists can be variously arranged and organized and that my invention is not limited to the precise arrangement and organization of these instrumentalities as herein shown and described.

Figure 1 represents a side elevation of a

hollow reinforced concrete tie embodying my invention, the same being shown in assembled position with respect to the chairs and the rails. Fig. 2 represents a transverse section on line $x-x$ of Fig. 1. Fig. 3 represents a transverse section of the mold showing the completed tie ready for removal from the mold. Fig. 4 represents a transverse section on line $y-y$ of Fig. 1, taken in proximity to one of the fastening devices. Similar numerals of reference indicate corresponding parts in the figures.

Referring to the drawings:—In the manufacture of my novel tie any desired type of mold may be used, and in Fig. 3 I have shown a mold consisting of two parts 1 and 2, which are hinged together, as indicated at 3, and secured together by any desired type of fastening devices 4.

5 designates a hollow reinforced concrete tie, embodying my invention, the outer contour of which varies in accordance with the type of mold employed.

6 designates reinforcements extending longitudinally through the tie, any desired number of which may be employed, such longitudinal extending reinforcements being spaced from each other and adapted to cooperate with annular reinforcements 7 which are wound around or interlocked with the longitudinal extending reinforcements 6 and have their ends twisted or otherwise secured together, as indicated at 8.

9 designates spacing members which are bent around the longitudinal extending members 6, and then extend angularly outwardly, as will be best seen by reference to Fig. 4, so that when the reinforcement are placed in position in the mold, formed by the members 1 and 2, such reinforcements will be suitably spaced relatively to the inner walls of the molds, and, in the broad scope of my invention, these outwardly extending spacing reinforcements 9 may be provided at any desired points, and, in the present instance, I have shown four sets of these being employed, it being of course apparent that any desired number may be used, and still be within the scope of my invention.

In order to prevent injury to the walls of the tie, such as is liable to occur when lifting jacks are employed to raise the tie from its bed, I reinforce the tie in proximity to the ends and have illustrated herein one manner of accomplishing this, as seen in Fig. 2,

wherein I have shown a reinforcing bar 10 which surrounds the longitudinal aperture 11 of the tie and has its free ends interlocked with longitudinal extending reinforcements 6, preferably located below the aperture 11, as is indicated at 12, it being understood that any desired number of these bars 10 may be employed.

In order that the rail chair will be properly spaced, the tie is provided near each end with a pair of spaced lugs 13, the inner faces of which are preferably vertical, as indicated at 14, while the outer faces thereof are preferably outwardly and downwardly inclined, as indicated at 15.

In order that the apertures for the fastening devices may be formed in the tie during the process of manufacture, I provide the mold with conical shaped cores 16 which form conical shaped apertures 17 in the tie, through which fastening bolts 18 are adapted to pass, said bolts engaging a gib 19, the outer face of which conforms to the inner contour of the walls of the aperture 11, as will be understood by reference to Fig. 4, said bolts passing through the rail chairs 20, which latter may be constructed of wood, metal or any other desired material, it being understood that the bolts 18 are provided with suitable fastening devices, such as the nuts 21.

22 designates the rails which are secured with respect to the rail chair 20 in any desired or conventional manner.

Owing to the novel manner in which the tie is formed, the heavier particles of the concrete mixture will tend to travel outwardly and toward the inner walls of the mold, the result of which will be that my novel reinforced concrete tie is denser and harder near the outer faces thereof than at the inner portion, the advantage of which is that the tie will not be injured by the bearing of the rails and the tamping of the ballast, thereby enabling me to produce a reinforced concrete tie in which the durability of the tie is greatly increased, and wherein the liability of the tie becoming injured by the contacting of foreign material thereagainst, is reduced to a minimum.

In the present instance, I have shown, for purposes of illustration, a preferred manner and arrangement of forming the spacing reinforcements, although it is to be understood that in the broad scope of my invention, the same may be located and spaced, in any desired manner, and still be within the scope of the invention.

So far as I am aware, I am the first in the art to produce a hollow reinforced concrete tie, which is of greater density at the outer portions, than at the inner portions thereof, and wherein the apertures for the fastening devices and the rail chair spacing lugs are formed in the tie during the rotation of the

reinforcements and the concrete mixture in the mold, and wherein provision is made at the end of the tie to prevent the walls of the apertures being injured by the lifting jack and it is to be understood that my claims to such features are to be interpreted with corresponding scope.

It will also be apparent that where a tie is formed as disclosed herein, the rail chair spacing lugs will be of greater density than the inner portions of the tie, and a more homogeneous concrete mass is produced than is possible to attain in cases wherein the tie is cast in a mold.

It will now be apparent that I have devised a novel and useful construction of a hollow reinforced concrete tie which embodies the features of advantage enumerated as desirable in the statement of the invention and the above description, and while I have, in the present instance, shown and described a preferred embodiment thereof which has been found in practice to give satisfactory and reliable results, it is to be understood that the same is susceptible of modification in various particulars without departing from the spirit or scope of the invention or sacrificing any of its advantages.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. As a new article of manufacture, a railroad tie having a surface adapted to support a rail and comprising a hollow reinforced concrete body, the outer portions of said body near the outer surface thereof being of greater density than the inner portions thereof whereby said tie is not liable to injury from the rail bearing and the tamping of the ballast and said concrete body having additional reinforcements surrounding the hollow ends to prevent injury to the tie from the lifting jacks.

2. As a new article of manufacture, a railroad tie having a surface adapted to support a rail and comprising a hollow reinforced concrete body provided with a longitudinal aperture surrounded by reinforcements embedded in the concrete and having on one face rail chair spacing lugs and apertures in proximity to said lugs to receive fastening devices, the outer portion of said body near the outer surfaces thereof being of greater density and hardness than the inner portions thereof whereby said tie is not liable to injury from the rail bearing or the tamping of the ballast.

3. As a new article of manufacture, a railroad tie having a surface adapted to support a rail and comprising a longitudinally apertured reinforced concrete tie provided with longitudinally extending spaced reinforcements, annular reinforcements secured to the longitudinally extending reinforcements and having their free ends extending

to an outer face of the tie, and a reinforcing bar at each end of the tie surrounding the upper portion of the aperture and secured to the other reinforcements.

4. As a new article of manufacture, a railroad tie having a surface adapted to support a rail and comprising a hollow reinforced concrete body provided with chair spacing lugs and a conical shaped aperture opening between said lugs and having means at its ends to prevent injury from the lifting jacks,

the outer portions of said body near the outer surfaces thereof being of greater density and hardness than the inner portions thereof whereby said tie is not liable to injury from the rail bearing or tamping of the ballast. 15

HENRY R. LEONARD.

Witnesses:

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H. S. FAIRBANKS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."